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COHEN, DIPPELL AND EVERIST, P. C.
CONSULTING ENGINEERS
RADIO-TELEVISION
1300 L STREET, N. W.
SUITE 1100
WASHINGTON, D. C. 20005
(202) 898-0111

DONALD G. EVERIST
SUDHIR K. KHANNA
WARREN M. POWIS
JOHN R. URAM, JR.
ROBERT W. GUILL
WILSON A. LA FOLLETTE

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY
JULIUS COHEN
(1913-1993)
RALPH E. DIPPELL, JR.
(1922-1992)

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June 11, 1993

Ms. Donna R. Searcy
Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Re: Comments on Notice of Proposed
Rulemaking, ET Docket No. 93-59

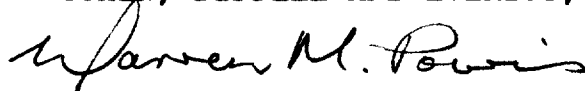
Dear Ms. Searcy:

Enclosed herewith are five (original and four) copies of comments by this firm in the Notice of Proposed Rule Making, "In the Matter of Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum for Wind Profiler Radar Systems, ET Docket No. 93-59, RM-8092".

If there are any questions, please do not hesitate to contact this office.

Sincerely,

COHEN, DIPPELL AND EVERIST, P.C.



Warren M. Powis
Vice President

WP:cc
Encl.

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of

Amendment of Section 2.106 of
the Commission's Rules to
Allocate Spectrum for
Wind Profiler Radar Systems

)
) ET Docket No. 93-59
) RM-8092
)
)
)

Introduction

These comments have been prepared by the consulting engineering firm of Cohen, Dippell and Everist, P.C. ("CDE") concerning the Commission's Notice of Proposed Rule Making (NPRM) and Notice of Inquiry (NOI) in ET Docket No. 93-59. Cohen, Dippell and Everist, P.C. and its predecessors have practiced before the FCC for over 50 years in broadcast and telecommunications matters.

In the NPRM, the Commission proposed to allocate the frequency of 449 MHz for wind profiler radar systems (wind profiler). The wind profilers are sensitive doppler radars used to detect atmospheric data up to elevations of approximately 15 kilometers including information on weather and storms and air movements. The Commission has considered several candidate frequencies and deemed that use of 449 MHz would have the least impact on other services. Operation on 449 MHz is proposed using a total bandwidth of 2 MHz (449 \pm 1 MHz).

Another alternate frequency, 441 MHz is compatible within the Canadian allotment for the same purpose but was deemed less desirable than 449 MHz due to military frequency usage

between 420 and 440 MHz. Due to the potential impact to broadcast auxiliary uses of 450 to 451 MHz for remote pickup and transmitter remote control/telemetry purposes, CDE urges the Commission to reconsider its proposed use of 449 MHz for the wind profiler primary allocation. Moreover, safety issues need to be adequately addressed by the FCC.

NTIA Information

Footnote 2 of the NPRM references an NTIA letter dated January 17, 1992, and three associated enclosures ("enclosures"). Review of the enclosures indicates the following parameters for Type A profilers.

- | | |
|---------------------------|---|
| 1. Peak transmitter power | 72 dBm (12 dBk) |
| 2. Antenna mainbeam gain | 32 dBi |
| 3. Peak EIRP | 104 dBm (44 dBk)
or 25,000 kilowatts |

The maximum power of 25,000 kilowatts is extremely high, particularly when compared to the power used for 47 C.F.R., Part 74 auxiliary broadcast licenses. For a stated wind profiler horizontal plane antenna gain of -25 dBi, the resultant peak EIRP is 47 dBm (-13 dBk).

The wind-profiler wide-band spectral energy is limited by a 7-pole bandpass filter with a 3 dB point at 4 MHz from resonance as described on Page 3-7, NTIA, Report No. 91-280. Figure B-4, Appendix B of this NTIA report assumes a -25 dBi wind profiler antenna gain in the horizontal plane and reports on the following approximate interference radii for wind-profiler and land-mobile operations. Desired to undesired ratios involved were not provided.

<u>Delta Frequency from Wind Profiler Carrier</u>	<u>Approximate Interference Radii Values^{1/}</u>	
	<u>Wind Profiler to Land Mobile</u>	<u>Land Mobile to Wind Profiler</u>
MHz	km	km
1.0	4.5	25
1.5	3.5	24
2.0	2.5	21.5
2.5	2.0	15.5
3.0	1.8	11
3.5	1.6	3
4.0	1.5	1.5

The wind profilers consist of vertical and/or near vertical (vertical $\pm 15^\circ$) beams of high intensity energy. The stated relative horizontal plane radiation is 57 dB below maximum energy levels.

CDE Observations

The following observations were made in conjunction with the CDE review of the NTIA report:

- Substantial interference to broadcast auxiliary users will result.
- 115 dBu blanketing contour extends approximately 50 km (30 miles) vertically.

^{1/}From Figure B-4, Appendix II, NTIA Report 91-280.

- Approximate field strength at 5 km (3 miles) vertical is 135 dBu.
- Approximate field strength at 0.5 km (0.3 mile) vertical is 155 dBu.
- Approximate vertical extent of 1000 uW/cm² radio frequency peak power density contour is 700 meters.
- Approximate extent of 200 uW/cm² radio frequency peak power density contour is 1.5 kilometers vertically.
- Aircraft flying through main wind profiler beams can reflect signals to ground; potentially well in excess of that computed for the horizontal plane cases for a wind profiler gain of -25 dBi.
- Fly-by-wire and other aircraft may be susceptible to the extremely high power field strength levels.
- Hot-air balloonists, hang-glider riders, and other airspace users may be subject to extremely high power density levels well in excess of the maximum public exposure levels.
- Information in the NTIA report indicates that the desired protected wind profilers bandwidth is more like 8 MHz, rather than the stated 2 MHz for electromagnetic compatibility purposes.
- For a vertical range of 0.5 km to 16 km, the corresponding horizontal radius is approximately 0.25 km to 5 km from a vertical reference line above the profiler site.

CDE Comments

CDE applauds the FCC for its efforts to make the airways safer for aviators and passengers through practical detection of usual and unusual weather and wind conditions. However, potentially conflicting issues which also involve public safety issues must also be

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- Excessive radio frequency exposure to other airspace users.
- Excessive radio frequency blanketing interference to aircraft communications and control systems.
- Electromagnetic incompatibility with broadcast auxiliary radio services. Broadcast licensees also provide public service and public safety information during emergency conditions, including inclement weather.
- Electromagnetic interference to and from other spectrum users may be exacerbated by reflections from aircraft and other objects passing through profiler service areas.

Comments and Conclusions

CDE urges the FCC to determine:

- If the wind profiler systems can operate with significantly lower EIRP's,
- If the transmission/reception of the wind profilers can be effectively achieved by limiting actual occupied bandwidth to 2 MHz using filtering systems.^{2/}
- If site selection techniques can be used to further restrict horizontal plane radiation from wind profilers.
- What is the potential effect of reflections of wind-profiler signals off aircraft surfaces to existing users?

^{2/}In a similar vein AM broadcasters limit out-of-band emissions by NRSC filtering standards.

- What is the potential effect of the propagation of wind-profiler signals during conditions of atmospheric "ducting" and other occasional abnormal propagation conditions?

CDE respectfully urges the Commission to assess the impact of the above matters when evaluating issues of electromagnetic compatibility between its proposed 449 MHz wind profiler operations and other spectrum users. The issues of wind profiler minimum operating powers, bandwidths, interference protection criteria to and from other radio services, and the allowable power density levels are of prime importance. The use of frequencies other than 449 MHz and compatibility with other users must be addressed.

If 449 MHz wind profilers are authorized as proposed by the NPRM, alternate spectrum for many existing radio services may be required.

Respectfully Submitted By,

COHEN, DIPPELL AND EVERIST, P.C.



Warren M. Powis,
Vice President

DATE: June 11, 1993